

# NOTES: Finding GCF of Polynomials:

## QUESTIONS: NOTES:

Vocab

Factors: Numbers that multiply together to get another number

Greatest Common Factor: the highest number that divides exactly into two or more numbers

When you distribute you multiply. The terms being multiplied are called factors of the product.

When you factor you divide. To do this you find the Greatest Common Factor of each term and then divide each term with it.

### EXAMPLES

Find the GCF of the numbers

1. 16, 24

$\frac{16}{1 \cdot 16}$      $\frac{24}{1 \cdot 24}$   
 $2 \cdot 8$      $2 \cdot 12$   
 $4 \cdot 4$      $3 \cdot 8$   
              $4 \cdot 6$

GCF = 8

2. 15, 60

$\frac{15}{1 \cdot 15}$      $\frac{60}{1 \cdot 60}$   
 $3 \cdot 5$      $2 \cdot 30$   
              $3 \cdot 20$   
              $4 \cdot 15$   
              $5 \cdot 12$   
              $6 \cdot 10$

GCF = 15

3. 21, 36, 9

$\frac{21}{1 \cdot 21}$      $\frac{36}{1 \cdot 36}$      $\frac{9}{1 \cdot 9}$   
 $3 \cdot 7$      $2 \cdot 18$      $3 \cdot 3$   
              $3 \cdot 12$   
              $4 \cdot 9$   
              $6 \cdot 6$

GCF = 3

Find the GCF of the variables

4.  $x^2, x^7$

$\frac{x^2}{x \cdot x}$      $\frac{x^7}{x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x}$   
 $x \cdot x$      $x \cdot x \cdot x$   
              $x$

GCF =  $x^2$

5.  $xy^3, x^5y^4$

$\frac{xy^3}{x \cdot y \cdot y \cdot y}$      $\frac{x^5y^4}{x \cdot x \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y}$   
 $x \cdot y$      $x \cdot x \cdot x$   
 $y \cdot y$      $x \cdot x$   
              $y \cdot y$   
              $y \cdot y$

GCF =  $xy^3$

6.  $a^6b^3c, a^3b^2c^4$

$\frac{a^6b^3c}{a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot b \cdot b \cdot b \cdot c}$      $\frac{a^3b^2c^4}{a \cdot a \cdot a \cdot b \cdot b \cdot c \cdot c \cdot c \cdot c}$   
 $a \cdot a \cdot a$      $a \cdot a \cdot a$   
 $b \cdot b \cdot b$      $b \cdot b$   
 $c$      $c \cdot c \cdot c \cdot c$

GCF =  $a^3b^2c$

\*smallest exponent of each common variable

Find the GCF of the monomials:

1. GCF of coefficients

2. GCF of variables

7.  $14x^2y$ ,  $20x^3y^2z$

$\frac{14}{1 \cdot 14}$	$\frac{x^2y}{\cancel{x \cdot x} \cdot y}$	$\frac{20}{1 \cdot 20}$	$\frac{x^3y^2z}{\cancel{x \cdot x} \cdot x \cdot y \cdot y \cdot z}$
$\textcircled{2} \cdot 7$	$\textcircled{y}$	$\textcircled{2} \cdot 10$	
		$4 \cdot 5$	

$GCF = 2x^2y$

8.  $12xy^2$ ,  $40x^4$

$\frac{12}{1 \cdot 12}$	$\frac{xy^2}{\cancel{x} \cdot y \cdot y}$	$\frac{40}{1 \cdot 40}$	$\frac{x^4}{\cancel{x} \cdot x \cdot x \cdot x}$
$2 \cdot 6$		$2 \cdot 20$	
$3 \cdot \textcircled{4}$		$\textcircled{4} \cdot 10$	
		$5 \cdot 8$	

$GCF = 4x$

9.  $8x^5$ ,  $24x^3$ ,  $16x^7$

$\frac{8}{1 \cdot \textcircled{8}}$	$\frac{x^5}{\cancel{x \cdot x \cdot x} \cdot x \cdot x}$	$\frac{24}{1 \cdot 24}$	$\frac{x^3}{\cancel{x \cdot x \cdot x}}$	$\frac{16}{1 \cdot 16}$	$\frac{x^7}{\cancel{x \cdot x \cdot x \cdot x} \cdot x \cdot x \cdot x}$
$2 \cdot 4$		$2 \cdot 12$		$2 \cdot \textcircled{8}$	
		$3 \cdot \textcircled{8}$		$4 \cdot 4$	

$GCF = 8x^3$